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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR     | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/735,429      | 12/12/2000  | Ramanathan T. Jagadeesan | 2705-131            | 5284             |

7590 09/29/2004

Marger Johnson & McCollom, P.C.  
1030 SW Morrison Street  
Portland, OR 97205

| EXAMINER |
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SEFCHECK, GREGORY B

| ART UNIT | PAPER NUMBER |
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2662

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                       |  |  |
|------------------------------|---------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/735,429  | <b>Applicant(s)</b><br>JAGADEESAN, RAMANATHAN T. |  |
|                              | <b>Examiner</b><br>Gregory B Sefcheck | <b>Art Unit</b><br>2662                          |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-68 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

- Applicant's Amendment filed 6/24/2004 is acknowledged.
- The previous rejections under 35 USC 112, 2<sup>nd</sup> paragraph are withdrawn.
- Claims 1-68 remain pending.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitfield (US006693921B1) in view of Hardy (US006370120B1) further in view of Clark (US006741569B1).

- In regards to Claims 1-3, 5, 6, 11, 12, 14, 15, 18-20, 22, 23, 28, 29, 31, 32, 35-37, 39, 40, 45, 46, 48, 49, 52-54, 56, 57, 62, 63, 65, and 66,

Whitfield discloses a method, apparatus and processing article for receiving and processing voice data transmitted over a packet network (Title; Abstract; claim 1/18/35/52 – device/article/method connected to a network for receiving and decoding/processing packets of sound/voice).

Whitfield shows the use of a jitter buffer that receives the voice packets from the network (Col. 1, lines 45-49; claim 1 – jitter buffer for receiving packets from network that encode sound data).

Referring to Fig. 3, Whitfield shows the use of sequence information for assembling the received packets and determining which packets are missing or lost (Col. 4-5, lines 40-18; claim 1/18/35/52 – determine intended sequence of the voice data from the received packets; claim 1/18/35/52 – arrange the packets in sequence; claim 1/18/35/52 – infer lost packets in places of the sequence not having a corresponding received packet).

Whitfield shows utilizing a predetermined QoS parameter that quantifies the distribution of lost packets with respect to a given number of transmitted packets (packet loss distribution; Col. 4, lines 7-13).

However, Whitfield does not expressly show dynamically determining or updating this statistic with the current received and analyzed voice data. Furthermore, Whitfield does not show determining a figure of merit for the received sequence of data based on the QoS parameter (statistic) of packet loss distribution.

Hardy shows a method, apparatus and software implementation for evaluating the quality of packet-switched voice signals. Hardy shows that the average rate of packet loss is used to determine the quality of the received packets of voice signals (Col. 7, lines 28-35; Col. 8, lines 37-65; claim 1/18/35/52 – determine burstiness statistic quantifying distribution of lost packets wrt received packets within the sequence). Hardy

shows that a received sequence of voice packets can then be characterized based on the packet loss parameters determined from the received data (Col. 2, lines 37-61; Col. 7, lines 15-28; claim 2/5/11/14/19/22/28/31/36/39/45/48/53/56/62/65 – determine a figure of merit for the sequence from the burstiness statistic; claim 3/6/12/15/20/23/29/32/37/40/46/49/54/57/63/66 – determine average packet loss rate; determine figure of merit using average packet loss rate).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method, apparatus and processing article of Whitfield by determining and modifying the QoS parameters of packet loss distribution for a received stream of voice packets, as taught by Hardy. This modification would improve the accuracy of the QoS parameters used in receiving and analyzing subsequent voice packets and enable characterization of the quality of the received voice packets.

Neither Whitfield nor Hardy disclose determining a burstiness statistic for quantifying non-uniform lost packet distribution with respect to the received packets within the sequence.

Clark discloses a quality of service monitor for multimedia communication systems. Clark discloses the monitoring and estimating of subjective voice quality within a packet voice system by incorporating the determined loss in subjective quality due to bursty loss - a high rate of packet loss within a short time period - which Clark shows to have a different subjective effect on quality than packet loss occurring at different times (Col. 2-3, lines 62-7, 39-62; Col. 4, lines 1-20; claim 1/18/35/52 –

determine burstiness statistic quantifying non-uniform distribution of lost packets wrt received packets within the sequence).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method, apparatus and processing article of Whitfield by determining a burstiness statistic for quantifying non-uniform lost packet distribution, as shown by Clark. Because packet loss bursts over short periods of time effect transmission quality differently than packet loss occurring over longer times, this modification would provide a more accurate quality indication of the packet transmission due to the emphasis on subjective quality based on a statistical distribution of packet loss over time.

- In regards to Claims 4, 10, 21, 27, 38, 44, 55, and 61,

Whitfield v. Hardy fv. Clark discloses a method, apparatus and processing article for receiving, processing, and determining packet loss statistics of voice data transmitted over a packet network.

Whitfield does not show counting a duration of contiguously occurring lost and received packets in the received sequence.

Hardy shows measuring and statistically summarizing the frequency and duration of dropouts (bad states) due to lost packets for the received voice data (Col. 7, lines 28-35). These measured statistics allow various calculations for quantifying the quality of the received packets (claim 4/21/38/55 – processor adapted to the burstiness statistic

by counting in the sequence at least one duration number of contiguously occurring of one of lost packets and received packets; claim 10/27/44/61 – processor is further adapted to determine the burstiness statistic by defining good states in the sequence that correspond to at least some of the received packets; claim 10/27/44/61 – defining bad states in the sequence that correspond to at least some of the received packets; claim 10/27/44/61 – counting a number of transitions in the sequence between good and bad states; claim 16/33/50/67 – count a number of packets and divide the count of transitions by the count of packets; claim 17/34/51/68 – counted transitions are from bad to good states; counted packets are lost packets).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method, apparatus and processing article of Whitfield by measuring the frequency and duration of dropouts due to lost packets in the received voice data, thereby enabling a calculation of probability that the speech will be perceived as being distorted by sudden changes in speech waveforms or occurrence of incomplete words.

- In regards to Claims 7-9, 24-26, 41-43, and 58-60,

Whitfield v. Hardy fv. Clark discloses a method, apparatus and processing article for receiving, processing, and determining packet loss statistics of voice data transmitted over a packet network.

Whitfield does not expressly show determining QoS parameters (statistics) of an average, maximum or variance of a plurality of duration numbers.

Hardy shows that the average frequency and duration of dropouts due to lost packets are measured and summarized statistically to calculate the distortion probability of the received voice data (Col. 7, lines 28-35; claim 8/25/42/59 – burstiness statistic is an average of a plurality of duration numbers). Similar statistics for maximum and variance measures for frequency and duration of lost packets could be used to gauge the quality of the received voice signal (claim 7/24/41/58 – burstiness statistic is a maximum of a plurality of duration numbers; claim 9/26/43/60 – burstiness statistic is a variance of a plurality of duration numbers).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method, apparatus and processing article of Whitfield by determining statistics for the average frequency and duration of lost packets, as taught by Hardy. This would enable statistical determination of the overall quality of the received voice signals. Similarly, determining a maximum or variance of the frequency and duration of lost packets could be used for determining other quality measures of the received signals.



- In regards to Claims 13, 30, 47, and 64,

Whitfield v. Hardy fv. Clark discloses a method, apparatus and processing article for receiving, processing, and determining packet loss statistics of voice data transmitted over a packet network.

Whitfield discloses a QoS factor that may include a missing packet ratio, which indicates a tolerable limit of lost packets to the total number of transmitted packets over a standard period of packets (Col. 4, lines 14-31; claim 13/30/47/64 – compute a normalized burstiness statistic from the burstiness statistic).

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1, 18, 35, and 52 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Gersht et al. (US006405257B1) discloses a method and system for burst congestion control in an Internet protocol network

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B Sefcheck whose telephone number is 571-272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2662

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GBS  
9-20-2004



HASSAN KIZOU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600